Healthy Infants and Children - *Overview*

Key points

- ***The health of infants and children predicts their health as adults.***
- ***Maternal health behaviors and health status affect infant survival and childhood development.***
- ***Vaccine-preventable diseases and exposure to environmental toxins have many social and economic costs.***
- ***Disease prevention and health promotion are more cost effective early in life than treating disease and disability later.***

Why is the health of infants and children important?

The health of infants and children affects their growth and development, predicts their health as adults, and sets the stage for future generations.

The foundation for health begins during preconception and continues throughout the first years of life. Inadequate health care, unhealthy environments, and poor nutrition predispose children to health problems that may compromise growth and development or cause poor health later in life.

Maternal health behaviors and health status affect infant survival and childhood development. Babies born to inadequately nourished mothers are at increased risk for being premature, having low birth weight, being small for gestational age, and having birth defects. The use of tobacco, alcohol, and illicit drugs, during pregnancy increases the risk for pre-maturity, low birth weight, and infant death. Smoking during pregnancy doubles the risk of having a low birth weight baby.

Vaccines have reduced or eliminated many infectious diseases that once routinely killed or harmed many infants and children. However, the viruses and bacteria that cause vaccine-preventable diseases and deaths still exist and can be passed on to people who are not protected by vaccines. Vaccine-preventable diseases have many social and economic costs: sick children miss school and can cause parents to lose time from work. These diseases also result in doctor's visits, hospitalizations, and even premature deaths.

During childhood, the health habits and other behavior patterns that persist through life are developed.

- Healthy eating in childhood is important for proper growth and development and can prevent health problems such as obesity, dental caries, and iron deficiency anemia.
- Regular physical activity in childhood improves strength and endurance, helps build healthy bones and muscles, helps control weight, reduces anxiety and stress, increases self-esteem, and may improve blood pressure and cholesterol levels.
- Injuries are one of the leading causes of death and disabilities among infants and children. Many injuries can be prevented by changing the environment, individual behavior, products, social norms, legislation, or governmental and institutional policy.

Children today live in an environment that is vastly different from that of previous generations.

- Exposures to environmental toxins, such as lead, are now known to cause permanent damage to a child's nervous system. While all children are at potential risk of lead exposure, the risk is higher for low-income and minority children.
- Asthma can be triggered by environmental factors such as air pollution and smog, animal hair, dust mites, and cigarette smoke. The loss of breath and lung spasms, if not controlled, can be fatal.

Why is the health of infants and children a critical issue for Missouri?

The health of Missouri's infants and children sets the stage for the health of future generations. Health promotion and disease prevention are more cost effective early in life than treating disease and disability later in life.

Healthy Infants and Children — Overview

- ✓ Twenty percent or more of the incidence of low birth weight (LBW) and small for gestational age (SGA) can be attributed to cigarette smoking. A single percentage point decline in smoking prevalence among pregnant women would prevent 1,300 cases of LBW annually and save $21 million in direct medical costs nationwide.
- ✓ Total medical care expenditures for fully breastfed infants is about 20% lower than those for never-breastfed infants.
- ✓ In Missouri in 2001, 11.6% of children 2-5 years old enrolled in WIC were overweight. Fifteen percent of that same group were at risk for overweight. Sixty percent of overweight children have at least one cardiovascular disease risk factor, and 25% have two or more. Hospitalization rates, with their resultant costs, for complications of overweight in children and teenagers have tripled.
- ✓ Only 15% of Missouri children received a blood lead test during 2002. Of those, 5% had blood lead levels of ≥ 10 mcg/dl. In 1996, the cost of reducing high blood lead levels in children ranged from $522 to $5,200 depending upon the child's blood lead level and resultant medical need.
- ✓ In 2000, there were 1,755 emergency room visits by children ages 4 through 8 as a result of a motor vehicle crash. The charges for these emergency room visits (charges reflect 1,753 visits, charges for two of the visits were not reported) totaled $1,071,002.00. Medicaid paid for 22% of the emergency room costs ($230,422.00).

SUCCESS INDICATORS	Healthy People 2010	2000 Baseline	2001 Actual	2002 Actual	2003 Target	2004 Target	2005 Target
Percent of live births that result in healthy birth weight babies	N/A	90.3%	90.5%	90.7%	90%+	90%+	90%+
Immunization coverage rate for two-year olds	80.0%	79.0%	79.0%	73%	81.5%	83.0%	84.5%
Percent of children (WIC 2-5 years old) who are overweight (≥95th percentile for BMI for age)	N/A	11.5%	*11.6%	12.5%	11.5%	11.0%	10.8%
Percent of children (WIC 2-5 years old) who are at risk for overweight (85th to < 95th percentile for BMI for age)	N/A	15.4%	*15.0%	12.5%	15.0%	15.0%	15.0%
Percent of children 9-11 years old who are at a healthy weight	N/A	58.7%	57.0%	60.0%	60.0%	60.0%	60.0%
Rate of lead poisoning (levels greater than 10 micrograms/deciliter) in children less than 72 months of age	0 (total elimination)	10.0%	6.0%	5.0%	4.0%	3.0%	2.0%
Rate of hospital emergency department visits for asthma for children aged 1-4	8.0/1,000 population	16.2/ 1,000 pop.	16.4	Avail Nov or Dec. 03	14.1	13.4	12.7
Rate of falls among infants and children that result in ER visits/hospitalizations (rate of fall-related injuries per 100,000)	NA	4061.1	4008.5	3956.0	3903.4	3850.9	3798.3
Rate of deaths among infants and children resulting from motor vehicle accidents (rate of motor vehicle deaths per 100,000)	NA	6.0	4.0	4.8	4.5	4.4	4.2

* In 2001, the data represents only one record per person. In previous years, all records submitted to CDC were included.

Success Indicator:

- **Percent of live births that result in healthy birth weight babies**

What are the trends and how does Missouri compare to others?

Low birth weight is defined by CDC as weighing less than 2,500 grams or less than 5 lbs. 9 oz. at birth. Low birth weight is the most important factor affecting neonatal mortality and is a determinant of post neonatal mortality.

The Pregnancy Nutrition Surveillance System (PNSS) was established in 1979 by the Division of Maternal and Child Health, Centers for Disease Control and Prevention (CDC). Missouri has used PNSS since 1989 to monitor behavioral and nutritional risk factors among low-income pregnant women enrolled in public health programs such as the Special Supplemental Nutrition Program for Women, Infants and Children (WIC). Out of the 39,427 examined records in the 2001 Missouri PNSS, 8.8% of the infants had low birth weight.

Of all women giving birth in 2001:
- 41% participated in WIC
- 44% were Medicaid-eligible.

Percent of Live Births that Result in Healthy Weight Babies

	1995	1996	1997	1998	1999	2000	2001
Missouri Rate	90.1%	90.2%	90.2%	90.0%	90.2%	90.3%	90.5%
United States Rate	90.3%	90.3%	90.2%	90.2%	90.1%	90.2	NA

Source: Missouri Department of Health and Senior Services, Missouri Information for Community Assessment (MICA).

Percent of Live WIC Births that Result in Healthy Birth Weight Babies

	1995	1996	1997	1998	1999	2000	2001
Missouri WIC Rate	85.6%	85.7%	85.9%	85.7%	86.0%	86.5%	86.5%
United States WIC Rate	89.0%	88.6%	88.1%	88.3%	88.9%	NA	88.7%

Source: Pregnancy Nutrition Surveillance System.

Interventions that work:

Maternal - Child Home Visiting

Currently there are three maternal-child health home visiting models funded by the Department of Health and Senior Services.

The first is an evidence-based program - the Prenatal and Early Childhood Nurse Home Visiting Program based on the David Olds Model of home visiting. The model is a prevention program that helps low-income, first-time mothers deliver healthy babies, obtain proper care, and avoid substance abuse and criminal behavior. In this program nurse home visitors work with women and their families in their homes during pregnancy and the first two years of life to improve pregnancy outcomes, improve child health and development, and improve the family's economic self-sufficiency. The major problems targeted for prevention are:

- Preterm delivery and low birth weight
- Child abuse and neglect
- Childhood injuries
- Rapid, successive unintended pregnancies
- Reduced participation in the workforce
- Conduct disorder
- Crime and delinquency.

The second, the Missouri Community-Based Home Visiting Program, is an interdisciplinary team intervention to provide family support through collaboration and research. The model utilizes nurses and paraprofessionals and provides intensive sustained visits and coordination of community services over a long period of time (2-5 years) with a small number of families. Goals for the programs are to increase healthy pregnancies and positive birth outcomes, as well as decrease child abuse and neglect through home based services, which provide assessments, education, referrals, and case management for Missouri families most at risk.

A crisis intervention home visiting program is the third model. The goal of the program is to promote healthy babies and to prevent child abuse and neglect through home-based services, which provide assessments, education, referrals, and case management for Missouri families most at risk. The program utilizes perinatal registered nurses who provide services for indigent families in Missouri including pregnant women, families with new infants, families with "medically fragile" infants, families with special needs infants, pregnant teens, teens with infants, and/or mentally challenged/developmentally delayed or mentally ill pregnant women and their infants.

DHSS Strategy for Supporting the Interventions

1. Evaluate the effectiveness of the home visiting programs currently in use in Missouri and expand those determined to be most effective to targeted areas with identified high risk populations.

Interventions that work:

Supplemental Nutrition Program for Women, Infants, and Children (WIC)

The WIC Program provides nutritious foods to supplement the diets of pregnant women, new mothers, infants, and children up to five years of age based on eligibility (nutritionally-related medical risk and income). It provides nutrition counseling, access to health services, and food to low-income women, infants, and children.

The following benefits are provided to WIC participants:

- Health screening and risk assessment
- Nutrition education and counseling at WIC clinics
- Breastfeeding promotion and support
- Referrals to other services specific to individual needs, such as health care providers and social services agencies, for immunizations, lead testing, and other needs
- Food instruments (checks) for supplemental nutritious food prescriptions

WIC is a federally funded non-entitlement program. In 2001, WIC served 40.5% of all infants born in Missouri.

The WIC target populations are low-income and nutritionally at risk:

- Pregnant women (through pregnancy and up to 6 weeks after birth or after pregnancy ends).
- Breastfeeding women (up to infant's 1st birthday)
- Non-breastfeeding postpartum women (up to 6 months after the birth of an infant or after pregnancy ends)
- Infants (up to 1st birthday)
- Children (up to their 5th birthday)

Targeted health risks include: low hematology, inappropriate growth patterns, inappropriate eating behaviors, and factors which affect pregnancy outcomes.

According to a 1997 study, participation in WIC resulted in 55 cents saved in Medicaid costs for every dollar spent on WIC, when prenatal costs before birth were included. When prenatal costs before birth were excluded, the resulting savings was $1.82 of Medicaid funds for every dollar spent on WIC.

DHSS Strategies for Supporting the Interventions

1. Develop, implement and evaluate WIC program policies, procedures addressing prenatal weight, maternal weight gain, and multi-fetal gestation

2. Increase the benefit that women receive from the WIC Program by increasing the number of women who redeem their food instruments

Interventions that work:

Breastfeeding Outreach and Support

Integrating culturally appropriate breastfeeding curriculum into the training received by physicians, nurses, and dietitians is instrumental in supporting breastfeeding families during the prenatal and postpartum periods. In addition, the training provided enables physicians, nurses, and dietitians to address breastfeeding issues with women of childbearing age during routine examinations and visits. Evidence-based feeding practices in delivery hospitals during the critical early days of an infant's life ensure that breastfeeding is successfully initiated prior to sending the mother and baby home. Continued support by well-trained health care professionals, peers, and family members is also essential during the entire breastfeeding period.

Limited studies indicate that the breastfeeding peer counselor program is effective in increasing breastfeeding initiation in specific populations, such as African-Americans and teens.

In Missouri in 2001, black children had the lowest percent of ever being breastfed:

- Missouri black children — 35.3%
- Missouri children — 47.3%
- National rate — 50.9%

Peer counselors provide information and support to pregnant women and new mothers who are considering breastfeeding or who have chosen to breastfeed. Peer counselors, who have previously breastfed, generally come from the same socio-economic background as the women they are counseling. Peer counselors receive 20 hours of training prior to working with pregnant or breastfeeding women. While studies indicate that the infant's father and grandmothers are very influential in the decision of the family to breastfeed, there are no known interventions targeting fathers and grandmothers that have been evaluated for effectiveness.

In addition to the specific efforts made for initiating breastfeeding in the hospital and support upon returning home, public awareness of the benefits of breastfeeding is necessary. Women are more likely to breastfeed longer if their efforts are supported by their work place, public policies, and community attitudes regarding "normal" infant feeding.

DHSS Strategies for Supporting the Interventions

1. Improve health care practices through implementation of lactation curriculum in medical and nursing schools.
2. Compare and evaluate the educational approaches used to promote and support breastfeeding in Missouri's programs, such as maternal-child home visiting and WIC to determine their relative effectiveness.
3. Develop and implement a pilot intervention to increase breastfeeding knowledge and support by family members who influence the woman's decision to breastfeed, such as partners and mothers.

Success Indicator:

- **Rate of immunization for two-year olds**

What are the trends?

The statewide immunization rate for children 19-35 months has improved by thirteen percentage points from 64% in 1994 to 77.7% in 2002 for the 4:3:1 series of shots. This improvement has resulted in the highest immunization rate in the history of the state.

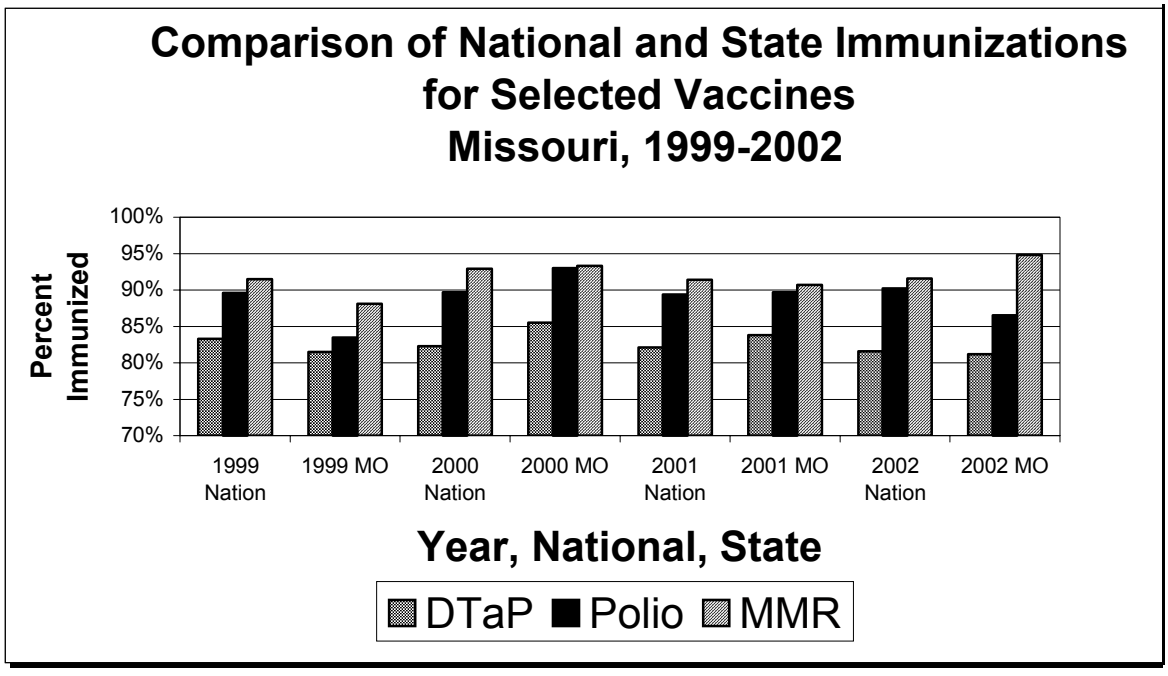
How does Missouri compare to others?

Using the Centers for Disease Control and Prevention's (CDC) National Immunization Survey (NIS), Missouri immunization rates can be compared national immunization levels.

In Missouri polio immunization was at 76% in 1994 and increased to 86.5% in 2002.

Rates of (DTaP) (diphtheria, tetanus & pertussis) vaccine have improved over the national rate.

MMR (measles, mumps, rubella) immunization in Missouri has increased to slightly ahead of the national rate.



Interventions that work:

Assessment and Feedback for Vaccination Providers, Provider Reminder/Recall, Client Reminder/ Recall)

A multi-component, evidence-based intervention that includes education (Assessment and Feedback for Vaccination Providers, Provider Reminder/Recall, Client Reminder/Recall) has been shown to be effective in increasing the demand for vaccination and enhancing access and quality of vaccination services.

Community-wide education should be aimed at improving the availability of information regarding vaccinations and increasing knowledge, acceptance and demand for vaccinations among clients, thereby changing behavior.

Provider assessment and feedback involves retrospectively evaluating the performance of providers in delivering one or more vaccinations to a client population and reporting this information back to the providers.

Reminders and recalls allow clients to know when vaccinations are due (reminders) or overdue (recall), as well as when to contact their vaccination provider to determine if vaccinations are needed. Provider reminder and recall systems make information regarding the client's immunization status available to providers manually or through a computerized system.

DHSS Strategies for Supporting the Interventions

1. Assist private providers in conducting clinic assessments to determine an immunization rate for their practice.
2. Promote reminder and recall activities for public providers and encourage private providers to implement reminder and recall activities.

Success Indicators:

- Percent of children who are overweight or at risk for being overweight

What are the trends?

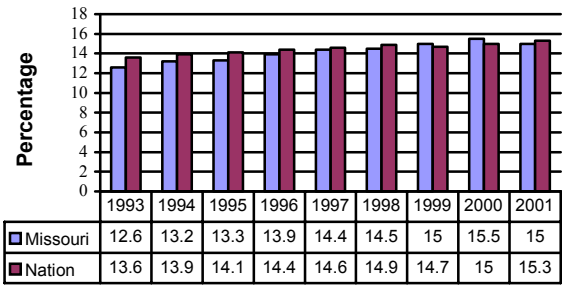
From 1993 to 2001, the Missouri data for children in WIC who are overweight (≥95th percentile for BMI for age), and those at risk for being overweight, follows the same slight upward trend as the national data.

How does Missouri compare to others?

The Missouri data follows the same slight upward trend for overweight as the national data.

Also, the data shows —

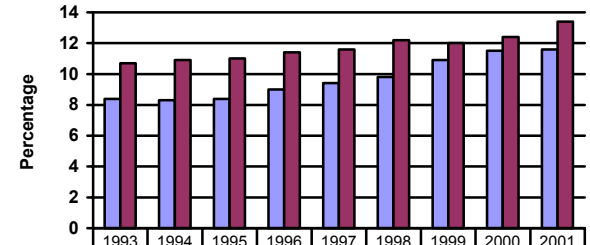
Missouri Children in WIC Aged 2 to < 5 Years Who Are At-Risk for Overweight



	1993	1994	1995	1996	1997	1998	1999	2000	2001
Missouri	12.6	13.2	13.3	13.9	14.4	14.5	15	15.5	15
Nation	13.6	13.9	14.1	14.4	14.6	14.9	14.7	15	15.3

Source: CDC Pediatric Nutrition Surveillance System

Children in WIC Aged 2 to < 5 Years Who Are Overweight
Missouri and National Trends



	1993	1994	1995	1996	1997	1998	1999	2000	2001
Missouri	8.4	8.3	8.4	9	9.4	9.8	10.9	11.5	11.6
Nation	10.7	10.9	11	11.4	11.6	12.2	12	12.4	13.4

Source: CDC Pediatric Nutrition Surveillance System

Interventions that work:

Community Policy and Environmental Change to Support Good Nutrition and Physical Activity

Building strong social supports in community settings through good nutrition and places for physical activity combined with informational outreach activities is necessary to support good nutrition and physical activity. The first step to ensuring that community policies and environments support good nutrition and physical activity is an assessment of the community's policies and environments.

- Access to food choices of high nutritional quality can be improved by providing milk, juice, and fresh fruit in vending machines.
- Access to places for physical activity can be improved by building or enhancing existing trails, sidewalks, or facilities.
- Good nutrition and physical activity can also be incorporated into the structured areas of the community, such as childcare facilities and schools.
- Communities need to provide programs that allow infants and young children to be physically active safely and to ensure affordable, skilled childcare providers who promote good nutrition and physical activity for infants and young children.

The CDC coordinated school health program includes components for a healthy school environment; planned, sequential health education; physical education; nutrition services; health services; counseling, psychological, and social services; health promotion for staff; and family and community involvement. The school health program should be implemented in elementary schools. In addition, the tool kit "Changing the Scene" developed by the United States Department of Agriculture (USDA) is an excellent resource for communities to use to improve the nutritional environment of schools.

For more description of the Coordinated School Health Program and "Changing the Scene" see Adolescent Health: *Health Risk Behaviors* and *Healthy Weight.*

DHSS Strategies for Supporting the Interventions

1. Support community initiatives and evaluate programs that promote healthy eating and physical activity.

2. Recommend and support improvement in the nutritional environments of schools through the use of the CDC School Health Index and the "Changing the Scene" toolkit.

4. Identify evidence– or science-based programs or interventions and the barriers in implementation through a report generated by the Missouri Council on the Prevention and Management of Overweight and Obesity that can be implemented to prevent or manage overweight in children.

4. Provide implementation recommendations to the state through the Missouri Council on the Prevention and Management of Overweight and Obesity.

Success Indicators:

- Rate of lead poisoning (levels greater than or equal to 10 micrograms/deciliter) in children less than 72 months of age

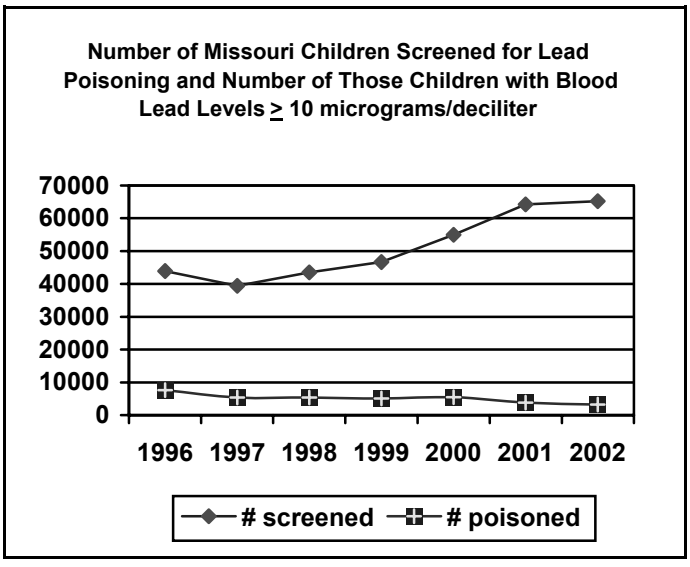
What are the trends?

Risk factors for childhood lead poisoning include, among other things, living in older housing with lead-based paint, lower socio-economic status, and living in homes undergoing remodeling. Missouri also has a vast history of lead mining. At one time, Missouri was the dominant producer of lead in the world. Waste still existing from the mining, milling and smelting of Missouri lead has been linked to increased exposure risks for children living in the former mining areas.

The trend of childhood lead poisoning in Missouri mirrors the trend seen nationally. Rates of lead poisoning are decreasing. Overall, the data shows:

- Decrease in the childhood lead poisoning prevalence rate from 17% in 1996 to 5% in 2002.
- Compared to 1996, approximately 20,000 more children were screened in 2002.

Those children most at risk of lead poisoning have always been the focus of screening. By screening more children since 1996, it is likely that populations less at risk are also being reached. The increase in screening appears to be a contributing factor in the decrease in childhood lead poisoning.

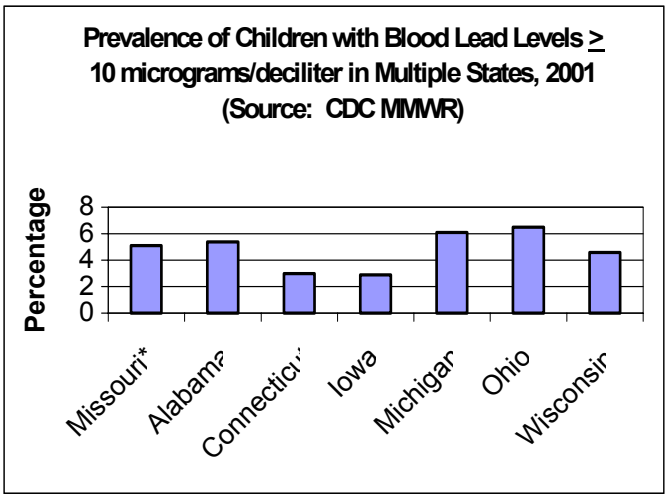


Source: Missouri Department of Health and Senior Services blood lead testing data.

How does Missouri compare to others?

Missouri has a slightly higher rate than the national rate (approximately 4% in 2001).

According to 2001 data from the Centers for Disease Control and Prevention, Alabama and Wisconsin have childhood lead poisoning prevalence rates similar to Missouri's, while the rate in Michigan and Ohio is slightly higher. Connecticut and Iowa have lower rates.



*This data is from the Centers for Disease Control and Prevention (CDC) and is calculated using CDC's definition of a confirmed blood lead level, which is slightly different than the definition DHSS uses.

Interventions that work:

Case Management of Children with Elevated Blood Lead Levels

Children identified with elevated blood lead levels should be evaluated and treated in accordance with Centers for Disease Control and Prevention (CDC) guidelines for follow-up care, including care coordination and public health, medical, and environmental management. Case management should include management of both the medical condition and the environment. For infants and children, the main source of lead exposure is chewing on or swallowing dust from items containing lead such as mini-blinds, lead painted woodwork, furniture, and toys.

Few children will have elevated blood lead levels high enough to warrant intensive medical treatment. However, all children with elevated blood lead levels will need some type of follow-up services. Examples of follow-up services include: more frequent blood testing, environmental investigation, case management and lead hazard control. The case manager assures that the family is educated about the importance of hygiene, nutrition, and ways to reduce lead hazards in their environment.

Medical care includes obtaining a detailed health history, assessment of signs and symptoms of lead exposure and toxicity, and nutritional evaluation. In addition to the screening test, this information allows the health care provider to initiate appropriate care planning and referral.

DHSS Strategies for Supporting the Interventions

1. Implement and evaluate the statewide plan for childhood blood lead level screening that addresses both universal and targeted screenings.

2. Ensure environmental assessments are conducted to identify hazards that are affecting the health of the child and recommend ways to reduce or eliminate hazards.

Success Indicators:

- Rate of hospital emergency department visits for asthma for children aged 5-14

What are the trends?

Asthma is the most common chronic disease of childhood and a leading cause of disability among children according to the Centers for Disease Control and Prevention. Overall, in the United States, asthma prevalence among persons aged 0-17 years increased approximately 5% each year during 1980-1995.

The Behavioral Risk Factor Surveillance System reported that of Missouri adults with children under the age of 18 in the household:

- 18.3% reported having at least one asthmatic child in 2001
- 16.3% of White, Non-Hispanic Missouri adults reported having at least one child in their household with asthma
- 35.3% of Black, Non-Hispanic Missouri adults reported having at least one child in their household with asthma
- 23.8% of Hispanic Missouri adults reported having at least one child with asthma in their household.

(Note: The estimated prevalence in childhood asthmas is reported by an adult respondent and does not necessarily reflect a clinical diagnosis.)

Missouri school nurses were surveyed in 1998 and 2003 to determine the number of children with special health care needs . The 2003 survey indicated that approximately 7.8% of school age children had asthma. (Note: The 2003 survey was completed by 70% of the school districts in Missouri. The responding school districts account for 70.4% of school age children attending public schools in Missouri.)

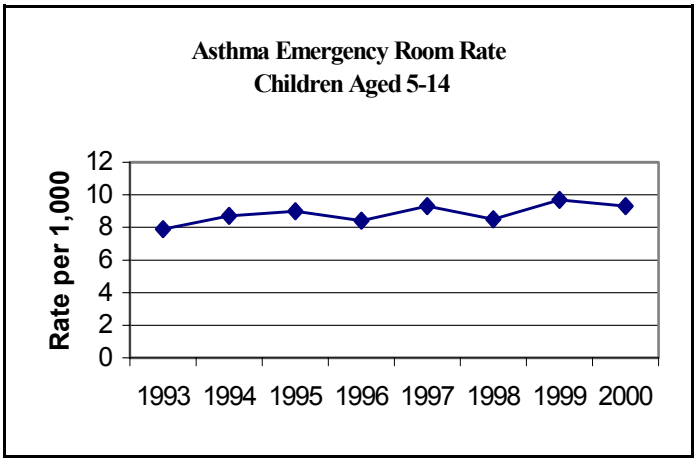
Special Health Care Needs Survey – Public School Nurses

Year	Number of Students in Schools Surveyed	Number of Students Reported to have Asthma	Percent of Students with Asthma
1998	538,437	31,647	5.9%
2003	629,877	48,983	7.8%

Source: MO DHSS, Division of Community Health, School Age Health Services Program

Trends in asthma in Missouri were analyzed using data of emergency room usage and hospitalization rates for the years 1993-2000. The results of the analysis are as follows:

- Asthma inpatient hospitalization rate has declined over the eight years
- Rate of emergency room rates has increased.
- Emergency room rates have remained relatively flat for the last five years.
- The changes in rates for the period from 1996 to 2000 are not statistically significant.



Source: Missouri Department of Health and Senior Services, Missouri Information for Community Assessment (MICA), Center for Health Information Management and Evaluation.

Interventions that work:

Coordinated Services for Asthma Prevention and Control

All children and their families need access to continuous, comprehensive, coordinated, community-based care that is family centered, compassionate, and culturally competent. These elements of care are particularly critical to the optimal growth and development of children with special medical needs, especially those with asthma.

Every child should have a medical home. A medical home, as described by the American Academy of Pediatrics (AAP), has the following attributes: the provision of preventive care; the assurance of ambulatory and inpatient care, 24 hours a day; strategies and mechanisms to ensure continuity of care (from infancy through adolescence); identification of and medically appropriate use of subspecialty consultation and referrals; interaction with school and community agencies; and maintenance of a central record and database containing all pertinent medical information, including hospitalizations.

Specifically for asthma, comprehensive care should include:

- Coordinated school health services for students with asthma which includes case management by a registered professional school nurse: written asthma action care plans; asthma education and awareness programs for students and school staff; safe enjoyable physical education and activity opportunities; and environmental policies that promote indoor air quality and enhances school, family and community coordination.
- Community-oriented health promotion programs that target asthma-preventable risk factors (second hand smoking, reduction of home allergens), school health, church-based, or community-based health promotion, including media campaigns to inform and increase awareness about asthma and preventability of complications.
- Physician educational programs to encourage the use of clinical practice guidelines.
- A regional consortium to coordinate and implement these strategies. The consortiums involve patients and their family, health care providers, public health sector representatives, and representatives of the community with potential impact on asthma prevention (e.g., industries, traffic authorities, urban development agencies, etc.).

DHSS Strategy for Supporting the Interventions

1. Use funding received from Centers for Disease Control and Prevention grant (2001-2004) to complete the statewide asthma plan and build capacity for implementation.

Success Indicators:

- Rate of falls among infants and children that result in emergency room visits/hospitalizations
- Rate of deaths among infants and children resulting from motor vehicle crashes

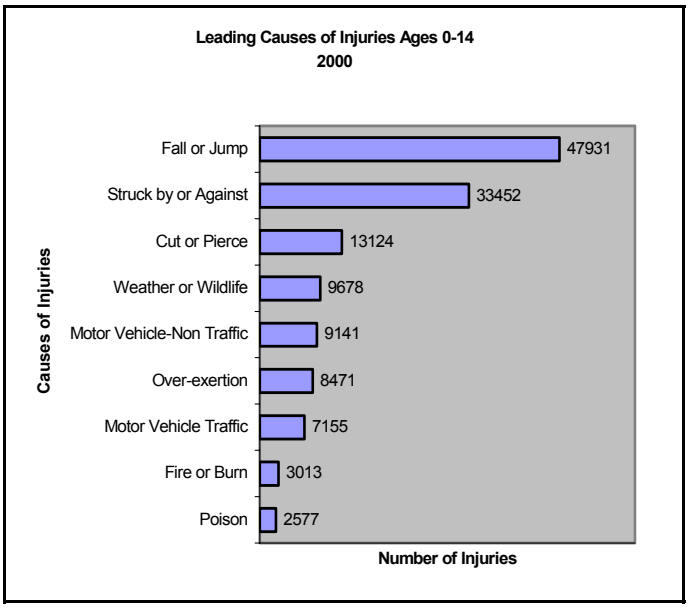
What are the trends?

Falls are the leading cause of injury among children. It's a surprising fact to many people who aren't aware of just how many different ways children are injured from falls. They can fall from windows, down stairs, off furniture, from bikes, and outdoor play equipment.

Every three minutes a Missouri child under the age of 15 seeks treatment in the emergency room or hospital as a result of a fall. In 2000, there were 47,931 fall-related injuries that required an admission to an emergency room or an inpatient hospital unit.

The rate of falls that result in injuries are highest among the 1-4 age group at 5,775.1 per 100,000 children compared to 3,531.5 for children ages 5-14 and 3,094.5 for children under 1 year of age. Boys are more likely to be injured than girls across the three age groups. Boys ages 1-4 have the highest rate at 6,536.5 per 100,000.

Motor vehicle related injuries kill more children than any other single cause in Missouri. Children ages 1-14 are more than twice as likely to die from a motor vehicle crash (63) than the next leading cause of death, malignant neoplasms (28).



Source: MO DHSS, Center for Health Information & Evaluation (CHIME) — Injury MICA

Injury Prevention Rates
(Missouri, Ages 0-14)

	1996	1997	1998	1999	2000	2001
Rate of Motor Vehicle Deaths per 100,000	N/A	6.1	6.4	5.0	6.0	4.0
Rate of Fall-Related Injuries per 100,000	3897.5	3741.9	3882.9	3940.3	4061.1	4220.0

Source: MO DHSS, Falls—CHIME Injury MICA, MV Deaths —CHIME Death MICA

Interventions that work:

Distribution and Education Programs and Ordinances Promoting the Use of Child Safety Seats

The Task Force on Community Prevention Services strongly recommends distribution and education programs for child safety seats. Distribution programs provide free loaner child safety seats, low-cost rentals, or direct giveaways. The task force also recommends delivery of community-wide information and enforcement campaigns in addition to incentive and educational programs for the use of child safety seats.

Child safety seat laws have been proven to increase child safety seat use by 13 percent. Fatalities are reduced by 35 percent and all fatal and non-fatal injuries are reduced by 17.3%.

Safety Education Programs

The most effective tool for preventing children's falls from windows is a window guard. Gates on stairways help prevent young children's falls, which are frequent. Pediatricians, public health nurses, and home visiting nurses can educate parents on fall prevention and installation of safety devices.

DHSS Strategies for Supporting the Interventions

1. Develop distribution and education programs regarding child safety seats, such as SAFE KIDS BUCKLE UP.
2. Develop community-wide information and enforcement campaigns that include educational workshops about properly fitting and safe installation of child safety seats, car seat inspection and stepped up enforcement of child safety seat laws.
3. Educate the public about fall prevention and use of safety devices within the home.